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Unit 6:

*Stream
Watershed
Survey*

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A Watershed Survey design objective is to create: a survey report listing and describing NPS pollution source “sites” in the watershed, and an increase in citizen awareness and action to adopt best management practices (BMPs) at these sites in the watershed.

Unit 6:

Stream Watershed Survey

A. Introduction

A Stream Watershed Survey focuses on finding, describing, and prioritizing specific sites throughout a watershed where nonpoint source pollution (NPS) is potentially impacting a stream. Some surveys also include an assessment of riparian buffer conditions as time permits. These assessments determine how much shading they provide, whether they are wide enough to filter pollutants, and whether they have a good mix of trees and shrubs versus being mostly lawn.

These surveys provide essential information for planning and implementing future projects aimed at installing best management practices (BMPs) to address NPS pollution (an NPS Watershed Project) or riparian buffer problems.

Watershed Survey Design Objective:

■ A Watershed Survey (WS) is designed to produce:

- A **Survey Report** listing and describing NPS pollution source sites in the watershed, along with relative importance (problem severity) ratings and preliminary recommendations (suggested fixes) for each site.
- An **increase in citizen awareness and action** to adopt best management practices (BMPs) at these sites in the watershed. Watershed surveys often prompt landowners to take action to reduce sources of polluted runoff contaminants such as eroded soil, excess fertilizer or pesticides, pet waste, petroleum spills, various toxins, etc., or improve or protect their riparian buffers. Survey results can be used to help attract local support for developing and conducting a NPS Watershed or Buffer Project.

■ ACTIVITIES:

WSs usually rely on trained volunteers from the community to identify the sources of NPS pollution. Following up on volunteer efforts, professionals evaluate the sites identified by the volunteers, prioritize them, and recommend general solutions. Other watershed survey tasks often include: forming the steering committee, publicizing the survey, training the volunteers, preparing the survey report, and informing the public through outreach efforts about the findings and recommendations of the survey.

B. Steps

The basic steps involved in developing and organizing a survey, including how to determine project leadership, assign responsibilities, and gather existing data are described in Unit 3. The information in this unit is designed to supplement this information with topics specific to Stream Watershed Survey (WS) planning.

These topics include:

- Plan the project (scheduling, dividing watershed into sectors, etc.)
- Secure funding
- Recruit volunteers and communicate plans with the public
- Hold a training session for the volunteers
- Conduct the survey
- Arrange follow-up field work
- Prepare and distribute survey reports

■ B I. PLAN THE PROJECT

(scheduling, dividing watershed into sectors, etc.)

B I a: SCHEDULING:

It's important to establish a time frame for each phase of the watershed survey. This ensures that surveyors are in the field during the best time of the year for seeing runoff-related NPS problems, and it provides volunteers with a deadline for returning field forms. Volunteer help is the backbone of the project, and their interest and enthusiasm is critical to the project's success. Volunteer interest is more easily sustained by giving volunteers clearly defined goals to accomplish within a reasonable time frame.

The best time to conduct the survey is in spring, soon after the snow has melted and the ground is exposed (usually mid-April through mid-May). At this time, runoff and erosion problems are usually most evident. Spring surveys are most effective because:

- The ground will probably be saturated with water from snowmelt. Under these conditions runoff from rainstorms is at a maximum and problems are more visible.
- Eroded areas are more visible due to the absence of ground cover vegetation.
- Maintenance on town and private roads has not taken place, and problems are more obvious than they would be after roads have been regraded and culverts reset.
- Eroded sediment in runoff flows is usually at its highest concentration and most visible because the freeze-thaw cycles and high levels of runoff weaken unstable soils.
- Enough time remains to complete the project during the summer months if needed.

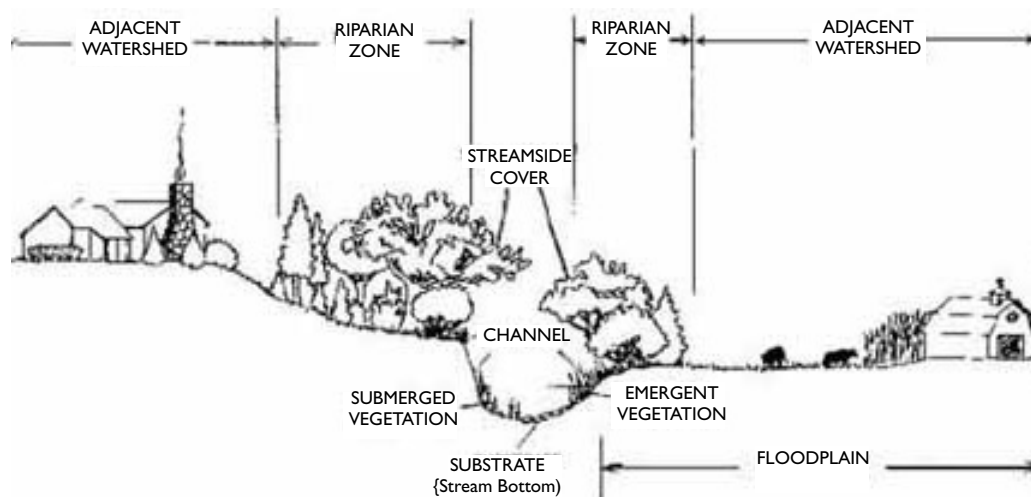
If a spring survey is not possible, the next best time is fall. Conditions, however, may not be as favorable, and safety issues are greater because of fall's hunting season. (It is recommended to avoid hunting season, whenever possible, or at least to have volunteers wearing blaze orange clothing.) Summer surveys can be conducted if volunteers are not available in the spring or fall, although problems will be much less visible compared to spring or fall conditions.

The amount of time to complete the field survey component of a watershed area (per team) is typically 1/2 to 2 days, though it may take more. Variables affecting length of time include: size of the watershed, complexity of pollution problems, and number of volunteers. The amount of time needed for gathering data on the watershed, doing follow-up, and preparing a report is variable.

From start to finish (including designing the survey, public meetings, training volunteers, conducting the survey, follow-up, and reporting), a watershed survey project generally will take at least six months, and often closer to a year. For a timeline of a typical watershed survey held in the late spring, see Table 6-2 below.

For help developing a timeline for your project, see Worksheet 6-1.

Table 6-2: Sample watershed survey timeline	
MONTH	TASKS
YEAR 1	
FEBRUARY-MARCH	<ul style="list-style-type: none"> • Seek funding opportunities (see Unit 3 – F)
YEAR 2	
MARCH-APRIL	<ul style="list-style-type: none"> • Form steering committee, appoint a technical team to oversee survey, gather existing data, and design project
APRIL	<ul style="list-style-type: none"> • Hold public information meeting, send out letter to landowners in watershed, press release, and/or volunteer recruitment
MAY	<ul style="list-style-type: none"> • Train volunteers and conduct survey
JUNE	<ul style="list-style-type: none"> • Wrap-up volunteer field work
JULY – SEPTEMBER	<ul style="list-style-type: none"> • Follow-up work by technical team
WINTER-SPRING	<ul style="list-style-type: none"> • Prepare and distribute report; meet with town officials and community members to develop action plan



(Source: USEPA)

Worksheet 6-1:**SETTING A SCHEDULE**

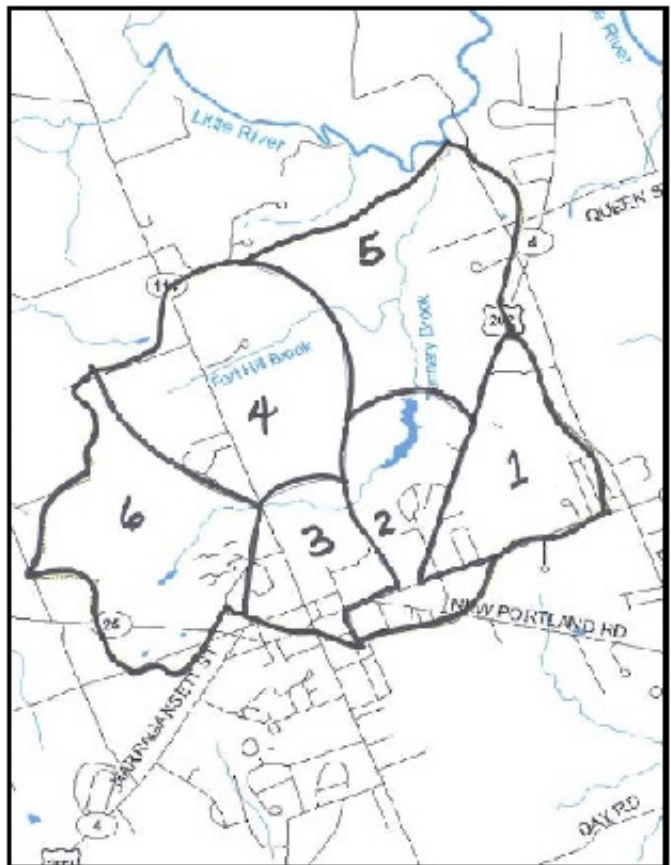
DATE	EVENT
	<ul style="list-style-type: none"><input type="checkbox"/> Gather information about the watershed.<input type="checkbox"/> Investigate funding opportunities.<input type="checkbox"/> Design project and project schedule, including volunteer training date and location.<input type="checkbox"/> Meet with watershed stakeholders (e.g.: local residents, municipal officials, neighborhood businesses, local conservation organizations [e.g., watershed councils, stream teams, land trusts, fishing groups] county soil and water conservation district (SWCD) and DEP staff) to identify preliminary interests and concerns, discuss feasibility, and seek funding.<input type="checkbox"/> Form steering committee.<input type="checkbox"/> Secure funding.
	<ul style="list-style-type: none"><input type="checkbox"/> Recruit volunteers.<input type="checkbox"/> Run article/notice in local newspapers.<input type="checkbox"/> Hold public information meetings.<input type="checkbox"/> Get permission from landowners whose property you will need to access.<input type="checkbox"/> Advise local law enforcement about the survey<input type="checkbox"/> Conduct training sessions for volunteers.
	<ul style="list-style-type: none"><input type="checkbox"/> Begin the survey.
	<ul style="list-style-type: none"><input type="checkbox"/> Volunteers complete and return survey forms to the volunteer coordinator.<input type="checkbox"/> Volunteer coordinator checks with each team to be sure work has been completed
	<ul style="list-style-type: none"><input type="checkbox"/> Technical staff conduct follow-up field work.<input type="checkbox"/> Technical advisors review volunteer data and report findings to steering committee.
	<ul style="list-style-type: none"><input type="checkbox"/> Prepare preliminary summary of findings and share with volunteers.<input type="checkbox"/> Address any critical problems with the steering committee and consider contacting landowners.<input type="checkbox"/> Hold public meetings to present findings.<input type="checkbox"/> Prepare final report.<input type="checkbox"/> Begin efforts to seek funding to address problems and develop watershed protection strategies.

B1b. DIVIDING THE WATERSHED INTO SECTORS:

Another important aspect of planning, which may impact the schedule you create, is the watershed itself.

- If you haven't already, create a map of the watershed (see Appendix D for watershed delineation instructions).
- Divide the watershed into clearly defined sectors, each small enough so that a few volunteers can cover it in approximately a day or less.
- Take population density and development intensity into consideration. (Higher population densities and/or development intensity will likely result in a greater number of NPS sites.)
- Establish sector boundaries along features that are easy to locate, like roads and streams.

As an example, the following watershed map has been divided into a few sectors with easily recognized boundaries. Your technical team may assist with this process.



The number and size of sectors in your watershed will impact:

- number of volunteers you need to recruit (2 to 3 volunteers per sector).
- time commitment per volunteer for the survey.
- number of technical advisors needed to help on the training day.

Table 6-3 provides some example watershed sector data and volunteer commitment required.

Table 6-3:

Examples of volunteer time commitments in different watershed types

**When communicating the expected commitment to the volunteers, it is safer to call it 15 hours, including training. Also, factor in more time if your watershed is known to have many severe sites.

Watershed Type	# Residences in watershed	Size watershed (square miles)	# Sectors	# Volunteers	Average time per volunteer (hours)
Urban	~ 250	1	4-5	15	8**
Rural	~ 250	5	5	20	6 - 10**

B1c. Conduct Preliminary “Windshield Survey” Reconnaissance of the Watershed *(Optional)*:

Project organizers are encouraged to conduct a rapid, preliminary survey by driving various parts of the watershed — in order to get a sense of what types of pollutant or riparian buffer issues team leaders and volunteers may encounter during the actual volunteer survey. Watershed areas which may require more time and attention can be identified during this process. Also, additional types of pollutants and/or other issues can be identified and added to the datasheets, if necessary.

Project organizers are encouraged to conduct a rapid, preliminary survey — in order to get a sense of what issues team leaders and volunteers may encounter.

■ B2. Secure Funding

See Unit 3 for more information about funding issues.

■ B3. Communicate with the public and recruit volunteers

Communicating with the public is a most important step in the survey process. Communicating through letters, press releases, or websites can be good ways to educate citizens about watershed issues. This also may result in recruiting additional volunteers. Alternatively, you may solicit help from other groups or organizations. (*See Unit 3, for more information.*)

At the very minimum, you must send out letters to each of the landowners whose land you need to access. Instructions and sample letters are included in Unit 4 and Appendix E, respectively.

■ B4. Hold training sessions for the volunteers

• What volunteers should bring to the training

Make volunteers aware of safety items to bring (e.g., water, snacks), appropriate field clothing, and gear considerations described in Unit 4. Also, if you don't have enough cameras and GPS units to loan to each survey team, check with volunteers to see if they can provide their own.

• Who should do the training

Training should be provided by technically-qualified individuals (i.e., technical team members) who have been selected by the steering committee. Names of qualified individuals can be obtained from the Watershed Management Division of the MDEP or your county soil and water conservation district.

• How the training is structured

Training is generally broken into two sessions. The first is an indoor session providing volunteers with background information on stream and watershed ecology and an overview of how the survey is conducted. The volunteers then break into their small groups (or pairs) by sector, and a member of the technical team typically accompanies each small group into the field to conduct the second session of training. Once the volunteers are comfortable identifying and documenting sites, they will be allowed to continue the survey without direct technical supervision.

• Fundamentals volunteers should learn

Volunteers should understand there are three fundamental questions that need to be answered in reporting each problem:

Where is the problem?

What is the problem?

How might this problem be fixed (as best as the volunteer can determine)?

Documentation that doesn't at least answer these three questions can slow the process and add considerable expense to the project. Ideally, problems should be reported with the greatest detail possible.

Volunteers should also understand the definition of a *site* in your survey.

Typically, a site is a **single land use** such as a town road, private road, driveway, house lot, streambank, logging area, farm field, industrial facility, etc. that can be marked on a map or with a GPS unit. Many groups choose to allow surveyors to write-up more than one problem (e.g., eroded soil, poor buffer quality, pile of lawn clippings near stream) per land use on a single Site Form (*Appendix K*). Note: it can be helpful to go over an example of a completed Site Form and a photo illustrating the example problem site during training.

■ **The following topics may be included in volunteer training:**

- What a watershed is and how it works.
- Tools for watershed management.
- How stormwater runoff, nonpoint source pollution (e.g., eroded soil, excess fertilizers and pesticides, leaking petroleum), and degraded riparian buffers affect stream water quality.
- Stream ecology and how changes to the stream's ecology reduce recreational enjoyment.
- How changes in water quality affect the local economy.
- The importance of — and methods for — keeping accurate and detailed documentation.
- Examples of typical erosion and other pollution problems (photos and slides as well as visits to actual sites).
- How to fill out a WS datasheet (*Site Form: Appendix K*).
- How to approach, and discuss the survey with, landowners.
- How to use GPS units, and the importance of recording every digit without rounding off (*see Appendix G*).
- Survey-specific details: survey deadline, how and where to hand over their completed survey materials.
- Next steps: how the survey data will be used.

■ **Establish teams of at least two for each sector**

Volunteers should work in teams of two for several reasons:

- Safety
- To share ideas about site evaluations
- To help each other consistently and accurately fill out datasheets
- To make the survey more fun (plus volunteers tend to motivate each other).

■ Distribute materials volunteers will need to complete the survey

Make sure each survey team has each of the following:

- Binder (or clipboard) to protect field sheets, etc.
- Pencils (pen ink runs when wet)
- Tape measure for measuring area of sites
- Camera (digital, if available or disposable)
- Watershed map (with sectors marked)
- Tax maps for each sector
- Handheld GPS units
- WS datasheets (*Site Forms: Appendix K*)
- Name tags or volunteer identification badges to wear and to place in car windshield
- Flip chart with numbers for site identification in photographs (*See Appendix H for instructions on how to easily make one.*)
- Extra landowner letters to hand out as needed
- Blaze orange safety clothing (e.g., vests, hats) for groups working on roads or during hunting season

■ Conduct field training

It's important that volunteers be taken into the field during training to see and learn about typical sources of sediment, phosphorus, and other pollutants.

If you have enough technical support available, divide the large group into smaller sector groups and send each small group into the field with a technical support person. These small groups may then start the survey, with the technical support person providing direction on identifying and reporting sites. Once the volunteers are comfortable with the survey process, they may proceed with the survey without direct supervision. Note that if you choose this option, the survey starts before training officially ends. (*See section B5 below.*)

Those groups lacking adequate technical support could do a large group field training. Special care will need to be taken to ensure that each volunteer has the opportunity to practice identifying a site, filling out the survey form, and receiving feedback. You may wish to scout out examples of erosion or other nonpoint pollution source (NPS) problems as well as examples of good conservation practices (BMPs) in advance of the training. A good resource in identifying appropriate sites for training could be your county soil and water conservation district office.

In either case, the field training is designed to give the trainees practice. In addition to seeing typical NPS problems, the survey teams should participate in a problem-solving exercise. Ask the volunteers to locate as many sites as possible within a specific area and to make recommendations to eliminate or minimize the problems from those sites. This exercise points out weak areas in the training process and allows volunteers to share ideas on mitigation measures.

■ B5. Conduct the survey

Some basic tips to keep in mind while conducting the survey:

■ Stay on Schedule

The survey should be conducted within the time frame set by the steering committee and technical advisors. Make sure the volunteers are aware of the survey deadlines. The public will be expecting volunteers to be surveying the watershed within the period of time discussed in newspaper articles and landowner letters. Staying within the designated time frame also allows time during the follow-up process for technical advisors to contact volunteers with questions concerning their findings.

■ Provide additional support for volunteers in the field

The volunteers may need technical support beyond what they receive in initial training sessions. If trainers and volunteers feel additional help is needed, consider meeting with volunteers again during the survey. This allows volunteers to check back with advisors during the day with questions, and it allows advisors to review survey forms to insure that information is being properly documented. This can save a lot of time for the technical team after volunteers have finished and are less available.

■ Interacting with landowners

Volunteers should be prepared to talk with watershed landowners. Their presence in the community will generate interest. People may approach them, questioning what they're doing, and the project leader may need to follow through on a problem they've identified by going onto private property. Volunteers should be encouraged to be proactive, checking to see if landowners are home and informing them about the survey and its goals.

The following is a list of things to help prepare volunteers. Everything on the list should be covered in training.

- ☐ Be sure volunteers take along a handout provided by the steering committee to give to landowners. The handout will explain the work you're doing (*see Appendix E for examples*).
- ☐ Be clear about the purpose of the survey:
 - ✓ You're trying to identify problems that may be impacting the stream; specifically, you're determining the pathways in which storm water carries eroded soil and other pollutants to streams and, in some surveys, also noting where riparian buffers are in poor condition.
 - ✓ You're developing solutions to the identified problems and creating an action plan detailing these solutions.
 - ✓ You're raising public awareness about the effects of polluted runoff on the stream and building support in the community for local watershed management.
 - ✓ You're not using the information for enforcement purposes. (This is usually the case, except in extreme situations.)
- ☐ Be prepared to discuss polluted runoff with landowners (*refer to Unit 2 for basic information on streams and watersheds*).

- ❑ Review how you might respond to difficult people.
- ❑ Always respect the property owner's wishes, regardless of the situation! Remember — enforcement is not the object of the survey. If you suspect a serious problem exists on a non-accessible site, note it on the survey form and a technical advisor can visit the site later if the landowner is agreeable. If in doubt about what to do, get a second opinion from another field volunteer.

Finally, and importantly, be sure to arrange a way to collect all equipment and forms once the survey is completed. A lot of groups arrange a collection spot at the town office.

■ B6. Arrange a survey follow-up by technical advisors

■ Give preliminary data to technical team for review

Immediately after the survey is finished, all data should be reviewed first by the volunteer coordinator (if there is one), and then by the technical advisor(s) to be sure each team has properly completed the survey forms and that all survey sectors have been completely covered.

If information is missing or incomplete, the volunteer coordinator should contact the volunteers immediately — this is essential — to ask them to provide the missing information or return to the field to get it. Volunteers may be reluctant to return to the field several weeks after the information has been collected. Contacting the volunteers shortly after they have completed their work can save the time and expense of having technical advisors spend hours in the field attempting to locate problems of undetermined location and nature.

■ Send the technical team into the field for follow-up site visits

A technical team advisor should do follow up in areas that were visited after the original training day (i.e., sites identified by volunteers without a technical advisor present). The purpose of this step is to check the accuracy of documented sites and to look for additional undocumented sites. This process may take several weeks, depending on the number of problems identified and the time availability of the technical team.

The technical advisor should expect to spend approximately the same amount of time (or possibly more) following up on each sector as the volunteers spent surveying that sector. If volunteers did a fairly thorough and accurate job, the follow-up by the technical person will take less time.

■ B7. Prepare and distribute final report

■ PRELIMINARY REPORT

Work with the technical team to prepare a preliminary report. Creating a preliminary report helps you to maintain momentum on a project, keeping it in the public eye. The preliminary report does not have to be lengthy (about two pages). Design it to give a brief overview of the extent of soil erosion, other NPS pollution, (and in some cases) riparian buffer problems in the stream watershed. Include information about the number of problems and where they were found.

Use the report to:

- Publicize the extent of nonpoint source problems in the watershed. This information should be made available to the towns in the watershed as soon as it is available. If a town official (planning board member, selectman, or town manager) is not on the steering committee, one should be contacted. The press may also be interested in preliminary findings. Remember to keep communication open during the entire process to maintain good public relations with the watershed community.
- Tally the number of sites identified and categorize them by land use (see Table 6-4). Keep track of the most frequent problems found for each major land use. You may even want to highlight some particularly significant problems.
- Serve as the basis for a final report.
- Inform the SWCD and the DEP about problems in the watershed that appear to be critical.
- Let volunteers know their data are being used, which will help keep them motivated and interested.

**Table 6-4:
Simple Land Use**

Land Use	Number of Sites
Town Roads	26
Private Roads	21
State Road	2
Driveways	18
Residential	18
Shoreline	12
Construction	5
Commercial	3
Gravel Pits	3
Logging	1

■ FINAL REPORT

The final report is more comprehensive than the preliminary report and should serve to organize, analyze, and communicate the results. Either a technical advisor or the steering committee can prepare the report. Ask members of the steering committee, technical team, and volunteer surveyors to review the report and provide feedback so that the report will be more thorough and balanced.

The final report may be used and referenced for many years in the future. If the stream should experience a change in water quality, the report may be valuable for providing a historical perspective on the types of problems that have existed in the watershed. The documentation of watershed protection efforts by the community may also help to get funding for mitigating future problems.

A Watershed Survey report should include the following information:

- Watershed overview
- Survey description
- Survey results
- Site list
- Data analysis
- General recommendations for fixing each type of site

☐ Watershed overview

Prepare a report-sized (8 1/2" x 11") watershed map and a general description of the watershed summarizing the background information you gathered before doing the survey.

☐ Survey description

Describe the purpose of the survey and the method of performing the survey.

☐ Survey results

Include a description of the overall level of development in the watershed relative to the number, type, and severity of problems found in the survey. Also include a general discussion of the kinds of problems typically found for each type of land use (agriculture, logging, industrial, residential, etc.).

If certain types of problems are recurrent throughout the watershed, recommendations could be made for developing local ordinance standards to prevent similar problems from occurring in the future. For example, if the road ditches in residential subdivisions are consistently found to be unstable and eroding into streams, a standard could be added to the local subdivision ordinance. Such a standard might require developers to stabilize ditches with vegetation or stone and to direct runoff from ditches to well-vegetated wooded areas, so that phosphorus and sediment would be filtered out.

Survey information can help to identify areas of the watershed where existing land uses have resulted in significant NPS problems due to poor soils, steep slopes, or other natural limiting factors to development. This information may also highlight the need for comprehensive stream water quality protection and serve as a basis for recommending that a town adopt a phosphorus control policy, or measures that control an assortment of stormwater/NPS pollution-related problems, which can be used when reviewing new land use applications.

❑ Site list

Prepare a spreadsheet of the sites with potential pollution problems. For each site, be sure to include the following:

- Site number*
- Tax map and lot*
- Location*
- Land use
- Type of problem/description
- Area affected
- Recommendations for fixing each site
- Impact (low/medium/high)
- Cost (low/medium/high)
- Technical level to install (low/medium/high)

**(This information is usually not listed in the report version, which is made available to the public, for privacy reasons.)*

The town tax map and lot numbers are a useful way to identify the sites in the report. Provide precise information about the location of sites, but do not make specific reference to the names of the landowners, particularly if the report will be made available to the public. This will help prevent the perception that the survey's purpose is for enforcement, which could alienate landowners.

Site data should be stored in both paper and computer files. Storing data in a spreadsheet program or database is useful because it consolidates the data, makes it easier to manipulate the data for analysis and reporting, and allows you to share your information more easily. There are a number of computer software programs for storing data, and these days most up-to-date programs are easily compatible with other spreadsheet/database programs.

Create and include a map overlaying the site locations on the watershed. If GPS units were used to document site locations, the points can easily be imported into GIS software to create a map. A good backup step to collecting GPS data using handheld equipment is to record the geographic coordinates on the (paper) site datasheets, in case the electronic data is lost or misplaced. Ask a member of your technical team for assistance as needed.



*Naturally occurring foam in a stream. Visit <http://www.umaine.edu/waterresearch/fieldguide/> for more information.
(photo: Helen McAlpin)*

❑ Data analysis

Analyzing survey data defines and prioritizes the problems in the watershed. It is often tempting to draw conclusions and develop solutions before or during the survey. Your group may find, however, that analysis of the data when the survey is finished reveals different causes of pollution than were expected.

Work with members of your technical team to sort the problem sites listed in the spreadsheet according to priority, based upon factors such as impact, cost, and technical level to install. (Some additional follow-up visits may be necessary.) These factors need to take into account characteristics such as:

- Size of the area affected by the problem
- Slope of the land where the problem occurs
- Type of landcover (e.g., asphalt, lawn, bare soil, or forest)
- Distance between the problem site and a ditch or the stream itself
- Natural treatment capacity by a buffer

Some pollutants carried by runoff may be naturally filtered or treated through a vegetative area (buffer) if the runoff travels through a field or woodland and it flows as a thin, uniform sheet of water and not traveling as channelized (stream-like), concentrated flow.

This ranking information will come in handy later when the data are used to prioritize where best management practices (BMPs) should be put into place.

One common way to analyze and summarize the data is to do separate sections on the most common land uses with their associated problems. Include the average cost and impact of issues within the land use, pictures of typical problems, and a pie chart or figure demonstrating the relationship between the total number of sites identified and the number of sites identified within that land use. (See *Figure 6-1 for an example of watershed survey data analysis and summary.*)

❑ General recommendations for fixing each type of problem site

❑ Distributing the final survey report

For the benefit of the project, distribute the final report as soon as possible to:

- Ensure open communication about the project.
- Demonstrate that the team completed the survey.
- Maintain project momentum.
- Allow volunteers to know their data is being used.

Consider sending the final report to the following organizations:

- Town offices relevant to the project.
- Maine Department of Environmental Protection (MDEP).
- Maine Department of Marine Resources.
- University of Maine Cooperative Extension.
- Appropriate county soil and water conservation district.
- Local land trusts and other conservation organizations
- Local libraries.
- Local newspapers and television stations.

Figure 6-1: Sample page from a watershed report.

Taken from *Trout Brook Watershed Survey (Cape Elizabeth and South Portland, Maine): Final Project Report*; 2006; South Portland Land Trust (SPLT) and MDEP. (NOTE: The appendices referred to below are in the original document and not this current DEP stream survey guidance manual.)

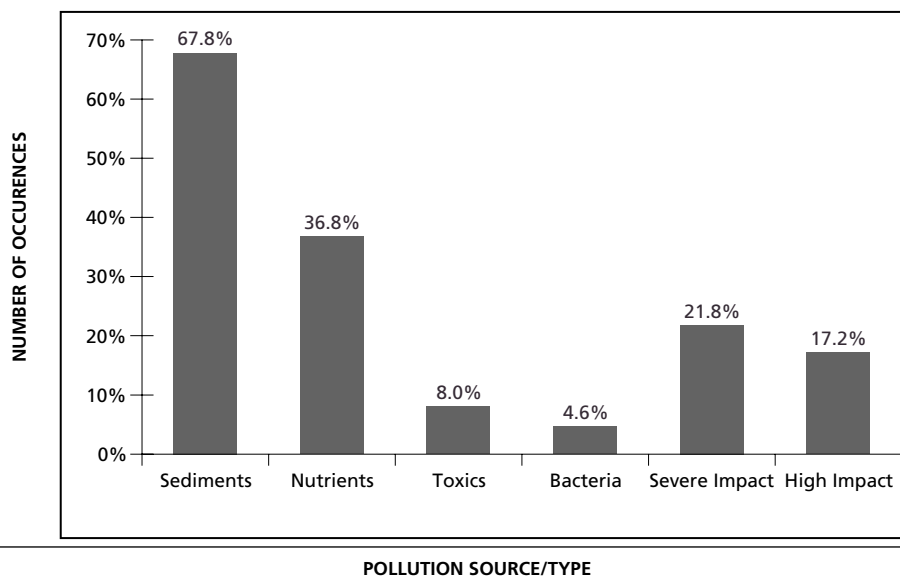
WATERSHED SURVEY SUMMARY

The SPLT determined that it would implement this Trout Brook watershed survey through the auspices of a Steering Committee, whose diverse members are listed in the Acknowledgements section. The committee met several times in late 2002 and early 2003. It divided the watershed into 6 sections, devised a Survey Field Sheet and Site Sketch Sheet for use in the survey, and arranged for the field surveys, which took place on April 26 and May 6, 2003.

In addition, it devised a form specifically for habitat analysis and arranged for a habitat walk, which took place on June 28, 2003. It sent a letter on April 1, 2003, to all 151 landowners whose properties abut Trout Brook and its tributaries, explaining the survey and giving contact information.

Eighteen volunteers conducted the field surveys on April 26 and May 6. They split into 6 teams, one for each section of the watershed, and then went out and viewed their sections. They looked for sources of pollution and filled out the Survey Field Sheet and Sketch Sheet for each pollution source identified. The field surveys identified a total of 86 sources/types of pollution. Figure 3 and Table 1 depict a summary of these findings.

Figure 3
Frequency and Percentage of Polluted Runoff Sites by Source and Impact



— continued on the next page

WATERSHED SURVEY SUMMARY EXAMPLE (continued):

The Field Survey Summary Table (*Table 1*) is derived from the Trout Brook Watershed Survey spreadsheet found in that report as Appendix 5. The spreadsheet gives greater detail and the location of each pollution source. Appendix 1 contains maps detailing each specific pollutant site.

Table 1:
Breakdown of Pollution Sites by Type and Impact

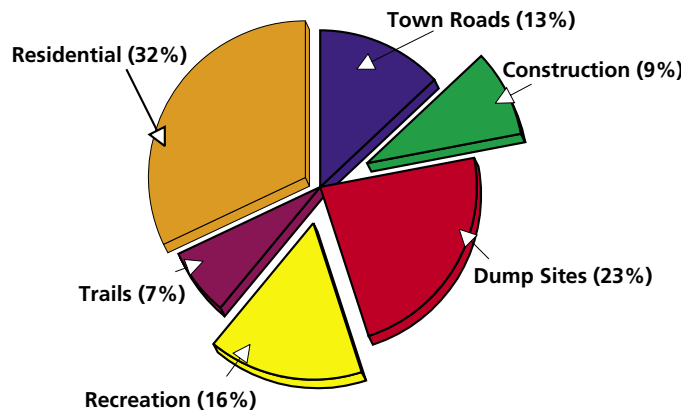
SECTOR	Total # pollution sites	# toxic pollution sites	# nutrient pollution sites	# sediment pollution sites	# bacteria pollution sites	# severe problems	# high impact on brook
1	14			14	1	6	4
2	23	3	10	12	2	6	5
3	2	2					
3A	6	1		6		6	6
4	3		1	2			
5	26	1	16	15	1	1	
6	12		5	10			
TOTALS	86	7	32	59	4	19	15

Some sites are sources for multiple types of pollution.

Land Use Breakdown and Common Pollution Sources

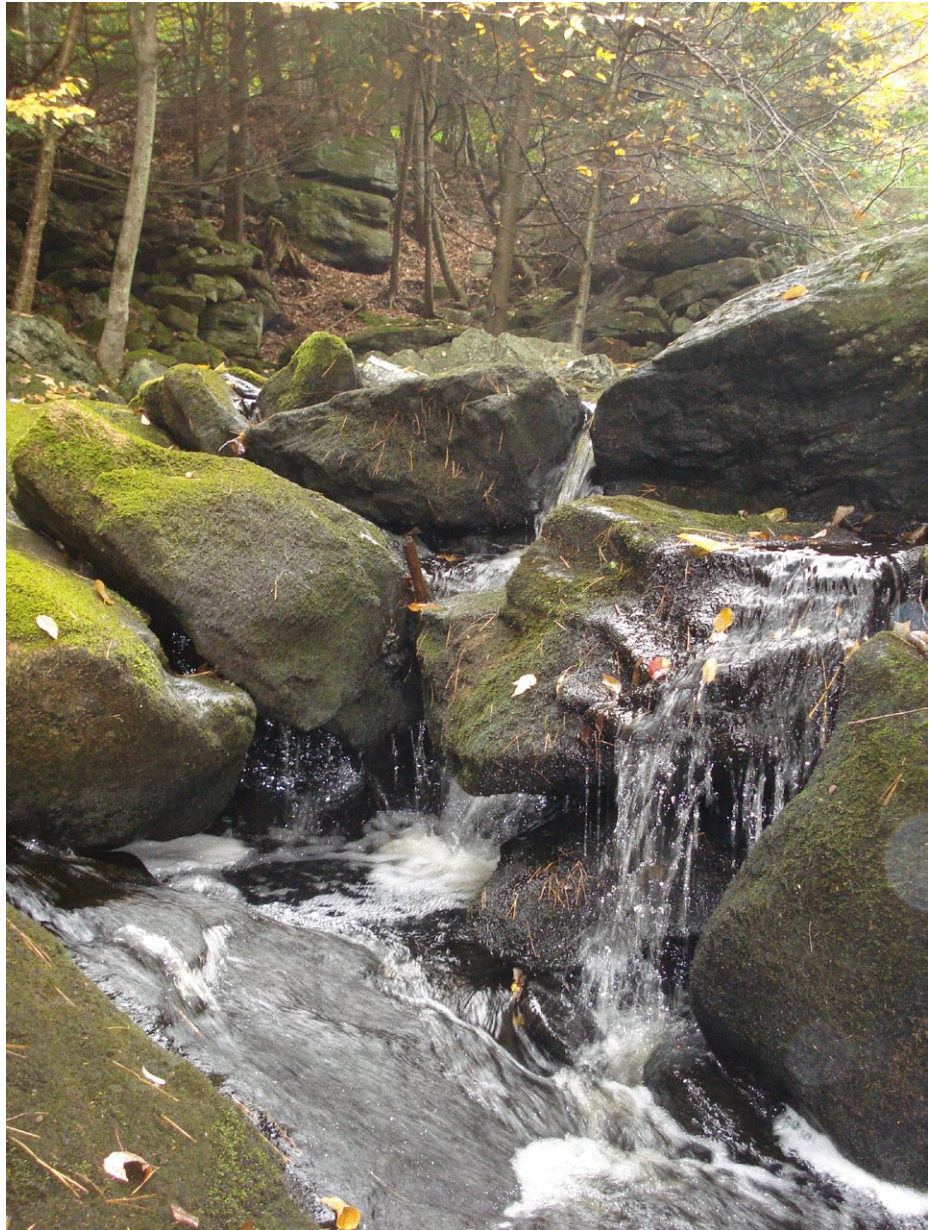
A total of six land use types were associated with the identified pollution sites. The highest numbers of problems were linked to residential areas, followed by dump sites, recreational areas, town roads, construction sites, and trails (*Figure 4*).

Figure 4



C. Next Steps

After you have completed the watershed survey and its report, refer to Unit 7 for suggestions on how to take action.



Courtesy: Casco Bay Estuary Partnership

